THE

VETERINARY JOURNAL

JANUARY, 1914.

THE LATE MR. J. A. THOMPSON, J.P., F.R.C.V.S.

FEW practitioners were better known or more popular in the North of Ireland than the late Mr. Thompson, and his death at the age of 56 has come as a surprise and shock to his numerous friends.

A popular practitioner, he qualified from the Dick Veterinary College in 1881, settling down in Lurgan in 1883, where he soon built up a very large private and consulting practice; in 1890 he gained the Fellowship Degree. His opinion was much respected by his brother practitioners, with whom he was on the best of terms, and his judgment was accepted as the final word by a very large *clientèle*.

In public life he occupied many positions of prominence, taking a large share in the management of the affairs of the town of Lurgan and in several associations connected with agriculture and horse breeding. In 1909 Mr. Thompson was made a Justice of the Peace, a position of honour which he occupied at the time of his death. His place, both in the profession and in his native town, will be hard to fill, and his death is one which is much regretted by a very large circle of friends and sincere admirers.

Editorial.

AN ASSISTANTSHIP AGREEMENT.

A CASE which carries with it a great deal of importance and interest to the members of our profession, as well as to those who practise other branches of medicine, has just been decided in the Court of Appeal, the facts briefly being as follows:—

The plaintiff, a medical man, specialized in certain laboratory work and employed another medical graduate as assistant,

requiring him to sign a bond not to engage in similar work either on his own account or on behalf of any other institution of a like character within a radius of ten miles, under a penalty of £250.

His assistant, after leaving his service, opened a similar laboratory on his own account at an address in close proximity, and the action was brought to prevent this.

At the first trial the judge held that the restriction in the agreement of service only endured during the period of service and entered judgment for the defendant. At the appeal the Master of the Rolls held that the restriction imposed by the agreement was not limited to the term of the engagement but endured for the whole of the defendant's life; but he expressed the view that the restraint imposed by the agreement *went beyond what was reasonably necessary for the plaintiff's protection.* He thought, therefore, that the plaintiff was not entitled to the injunction he claimed and that the appeal failed. Lord Justice Swinfen Eady differed, being of opinion that the restraint imposed by the agreement did not go beyond what was reasonably necessary for the plaintiff's protection, but Lord Justice Phillimore agreed with the judgment of the Master of the Rolls, and the appeal was dismissed with costs.

The words in italics are ours, for it is in them that the gist of the whole matter lies, and the point for an employer to bear in mind and to be rightly advised about is "what is reasonably necessary for one's own protection."

As a rule, in veterinary practice it is usual for an employer to bind his assistant off from practising within a radius of ten miles in the country or four miles in a large town—and such has been held to be fair and reasonable, as we have to go much further afield and cover a much larger area than our medical colleagues in order to earn a living; but if too large an area is allotted and signed for, the agreement can be set aside, and it is well for the fact to be well known.

As to whether it is professionally dishonourable or not to break one's word when it has been so deliberately given as to be actually put in writing is another matter. Most men would think so, but here and there one finds exceptions to the rule, and in order to guard against such contingencies it is necessary that the employer should protect himself by every legal means within his power; and in order to do this he should endeavour to employ

a lawyer who knows his business. To endeavour to do it in amateur fashion or with inexperienced help would be to court disaster, and it is on points such as this case in question, where even the judges themselves differed, that the law affords some of its greatest surprises.

SHOULD LADIES BECOME VETERINARY SURGEONS?

A LETTER on the above subject, recently addressed to the Council of the Royal College of Veterinary Surgeons, together with a case brought before the Court of Appeal as to the right of women to practise at the Bar, has reopened the question of the rights of women to practise in these two professions in the same way as in the practice of medicine. Some years ago a lady demanded the right to sit for the Examinations for the Diploma of the Royal College of Veterinary Surgeons and, as it was unchivalrously refused, took the case to Court, but was defeated temporarily on certain technical points not at all connected with the main question at issue. Since then the matter, as far as the veterinary profession is concerned, has been dropped, and although inquiries have from time to time been made the matter has never been fought out to a real finish. As to whether the profession is, or is not, suited to members of the gentler sex is a matter of opinion, although there is no question as to the great possibilities for them in canine work, and the lady who can successfully qualify and establish herself in some large town has an excellent future to look forward to. For the larger animals the question of physique must be taken into consideration, as the life of a country practitioner involves frequent and prolonged exposure to the weather and the handling of heavy and sometimes rough animals.

The legal aspect as regards the permission to sit for examination is, however, the first essential, as without it the Diploma is unattainable, and the recent decision given against the lady aspirant for legal honours will tell heavily in any future case of a similar nature brought against the Royal College of Veterinary Surgeons.

Briefly, the decision was that the practice of the law was a very ancient one, and that ever since attorneys as a profession have existed women have never been admitted to the office; for

this reason it was held that the applicant was not entitled to insist upon being examined by the Law Society with a view to entering the profession.

FOOT-AND-MOUTH DISEASE.

THE recently reported recrudescence of foot-and-mouth disease in England will make the abstract on p. 6, taken by permission from the official Report of the Department of Agriculture for Ireland, of more than usual interest, for apparently the country practitioners and port inspectors must for some time to come be on the alert. The full report consists of some seventy-four pages with twenty-four illustrations, and enters very fully into details, and it is with the object of drawing attention to the clearness of these that our abstract is made. Especially do we commend it to the younger generation of practitioners whose opportunities have not occurred to see actual cases, for the differences of opinion in diagnosis which were made during the 1912 Irish outbreak, even by experienced practitioners, illustrate full well that the disease may readily be mistaken with certain other conditions of the mouth and tongue frequently met with in certain districts of Great Britain.

LITERARY NOTE.

WE are informed that the copyright of that unique and beautifully illustrated work on the "Surgical Anatomy of the Horse," by Mr. J. T. Share-Jones, M.Sc., F.R.C.V.S., Lecturer on Veterinary Anatomy at the Liverpool University, has been acquired by Messrs. Baillière, Tindall and Cox from Messrs. Williams and Norgate.

The three volumes already issued can now be obtained from them, and volume iv, which concludes the work, is in preparation for publication in the spring. It will be replete with illustrations, both plain and coloured, and will treat of the foot, throat and back, abdomen and loins, the urinogenital organs, heart and blood-vessels, and the muscles of the trunk.

For further particulars see advertisement on p. ix.

General Articles.

THE GREAT VALUE OF IODINE AS AN ANTISEPTIC FOR THE SKIN IN THE SURGERY OF ANIMALS.

By FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.
Kensington, W.

Iodine in various forms, especially as the tincture or the liquor, has been used for generations by the old farmers and also by the modern veterinarian, but principally as a wound lotion diluted with water. Its chief objection has been that it has stained the hands of the dresser.

About ten years ago its use was revived in a somewhat different manner for external application to the unbroken skin, its value in this being especially pointed out for human surgery. It was shown quite conclusively, after numerous experiments, that if either the tincture of iodine or iodized chloroform were merely painted over the unbroken skin and allowed to dry, the skin became practically germ-free for the time being, and also that this effect was much more marked when the skin had not been previously scrubbed and washed; the reason for this being that the irritation and cleansing produced by the scrubbing caused the dermal cells to swell, and so be in a condition in which the iodine penetrated much less readily.

In animal surgery the use of iodine has not been practised as extensively as it should have been and its use ought to become more general, for its effects, if used properly, are simply marvellous.

In a busy surgical practice during the past four years, in operations which have included a very large number of such important abdominal operations as removal of retained testicles, ovariotomy and ovaro-hysterectomy, the following practice has been adopted with equally admirable success in large horse patients as in the dog and cat.

The hair has been removed with a sharp razor by dry shaving, no washing or scrubbing being done, and the parts painted either with plain tincture of iodine or iodized chloroform (generally the former) about ten minutes before the skin was incised—just sufficient time being allowed for the iodine to dry on the surface of the skin. When the operation was completed and the sutures

were united the parts were again painted, and this was done twice a day (or, in some cases, only once), the sutures being ready for removal and the wound cicatrized about the sixth or eighth day. In scarcely any instance was a bandage applied, nor was it necessary, as it was most rare for a dog to attempt to lick at the sutures, thus proving that if a wound is aseptic there is no irritation.

The use of iodine in this way can be safely and emphatically recommended in veterinary patients where surgical measures are necessary.

A REPORT ON FOOT-AND-MOUTH DISEASE IN IRELAND IN 1912 TO THE DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

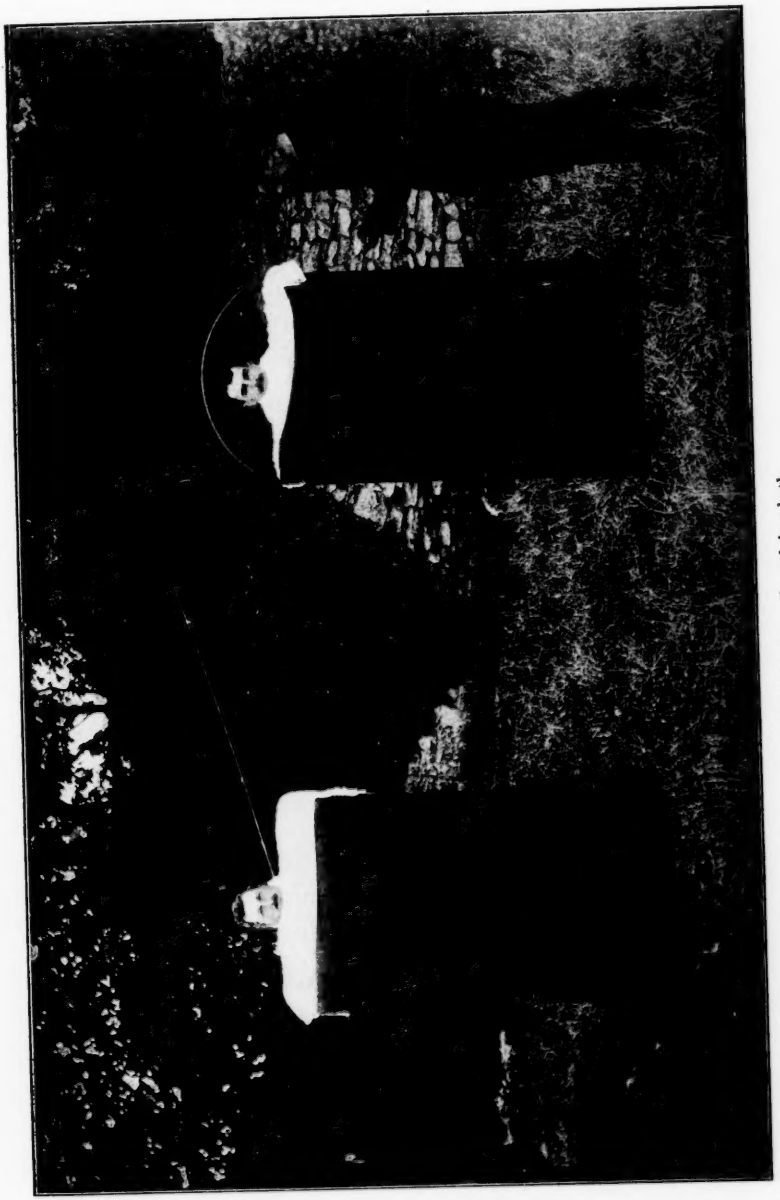
(*Abstracted.*)

Ireland's Long Immunity.

Until the end of June, 1912, Ireland had been wholly free from foot-and-mouth disease for more than twenty-eight years. During all that time of immunity in Ireland the disease had raged on the Continent, and recurrent attacks had occurred in Great Britain.

On all occasions of outbreaks in Great Britain measures of precaution were taken to prevent the introduction of the disease into Ireland. These measures included the stoppage for the time being of the importation into this country from Great Britain of cattle, sheep, goats and other ruminating animals, and swine, the disinfection on arrival in Ireland of dealers and drovers coming from British markets, and, in recent years, the temporary prohibition of the landing of hay and straw for use as litter or fodder for animals. The success of this precautionary action is attested by the fact that in none of these cases, though of frequent happening, was the infection carried into Ireland.

It should be mentioned that some animals had been under treatment since June 15 by a local "cow-doctor," who is not a veterinary surgeon, and who had been called in by the herd. This man had mistakenly treated the animals for an affection commonly known as "timber-tongue."



Disinfecting—the sulphur bath.

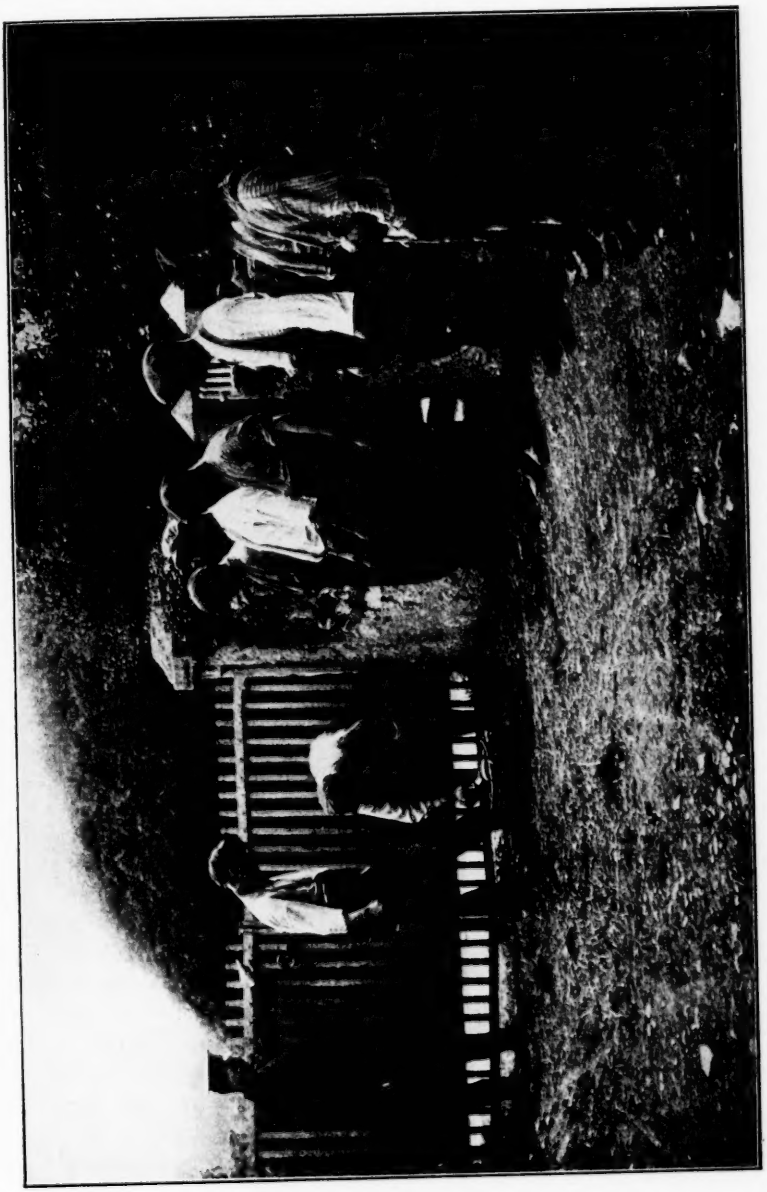
Measures were taken immediately to guard against the spread of the disease from the infected locality. The assistance of the Royal Irish Constabulary was sought, and was freely accorded by the Inspector-General, with the concurrence of the Under Secretary to the Lord Lieutenant. A rigid guard of police was maintained round the farm on which the outbreak occurred, with the object of preventing all movements of persons or animals which would be likely to spread infection, and this farm was, by an Order of the Department, declared an "infected place" and made subject to the restrictions (to be described later) which apply to such places. In consequence of this outbreak fifty-four diseased cattle in all were slaughtered, and seventy-six cattle and two pigs were also slaughtered, not as being diseased, but as having been in contact with diseased animals, and thereby exposed to infection.

The steamship *Slieve Bloom*, on which the diseased animals had travelled, was thoroughly disinfected with carbolic acid and repainted.

Immediately on the occurrence of the first outbreak the Department despatched to Swords all the available members of their staff of veterinary inspectors. At the same time the entire staff of the veterinary branch, wherever stationed, were notified that they might be required immediately to take up duty in connection with foot-and-mouth disease, and all officers on leave of absence were recalled. The staff was strengthened by the temporary employment of additional veterinary surgeons. The number of extra temporary inspectors eventually reached thirty.

Further Outbreaks at Swords.

On July 1 two further outbreaks were confirmed on the demesne situated at Miltonfields, Swords, close to the scene of the first outbreak. On July 2, 4, and 5 five further outbreaks occurred in the same vicinity. Between July 8 and July 22 eight outbreaks took place, and another (the final outbreak in the district) occurred on August 14. The total number of outbreaks in the Swords district was, therefore, seventeen. The number of animals found diseased on the several farms at Swords where foot-and-mouth disease occurred was 208 cattle and one sheep. The total number of animals slaughtered—including those diseased and those exposed to infection—was 1,006 cattle, 881 sheep, 26 swine, and 15 goats.



Labourers disinfecting boots.

On July 18 the restrictions on all movements of cattle, sheep, goats and swine, applying to Dublin and the adjoining counties, were modified so as to exclude Counties Wicklow and Kildare and the parts of County Meath lying to the north and west of the railway lines from Drogheda to Navan and from Navan to Kilcock.

As an additional measure of security the Department prohibited by Order the movement of hay or straw out of, or within, five electoral divisions at and around Swords.

The Scheduled Districts.

As soon as the existence of foot-and-mouth disease at Swords was definitely known, the Department, as already mentioned, issued an Order which created a large scheduled district, comprising the City and County of Dublin and the bordering Counties of Meath, Kildare, and Wicklow. "Stand-still" restrictions were imposed on this scheduled district. The Order forbade the movement of any cattle, sheep, goats or swine into the district or out of it. It also prohibited the movement of any cattle, sheep, goats or swine, along, over, or across, any highway or thoroughfare within the scheduled district, or their being allowed by the owner or person in charge of them to stray upon a highway or thoroughfare within the district. This drastic prohibition formed a very effective embargo on all movements of animals which would be likely to spread the disease.

The Department, however, in scheduling such districts reserved to themselves, by a provision in their Orders, the right to permit exceptions to the general prohibition in special cases. Licences for movements prohibited by the Orders were granted by the Department in exceptional cases of undoubted necessity, and when the Department were satisfied that no danger of conveying infection would arise from the movements. No animals were in any circumstances licensed to be moved into, from, or within, a scheduled district, except after careful veterinary inspection, and the movements were in nearly all instances conducted under police supervision. The number of animals allowed to be moved in this fashion was, of course, comparatively very small.

When, after a short period, the scheduled district comprising the four counties mentioned was reduced somewhat in extent, the

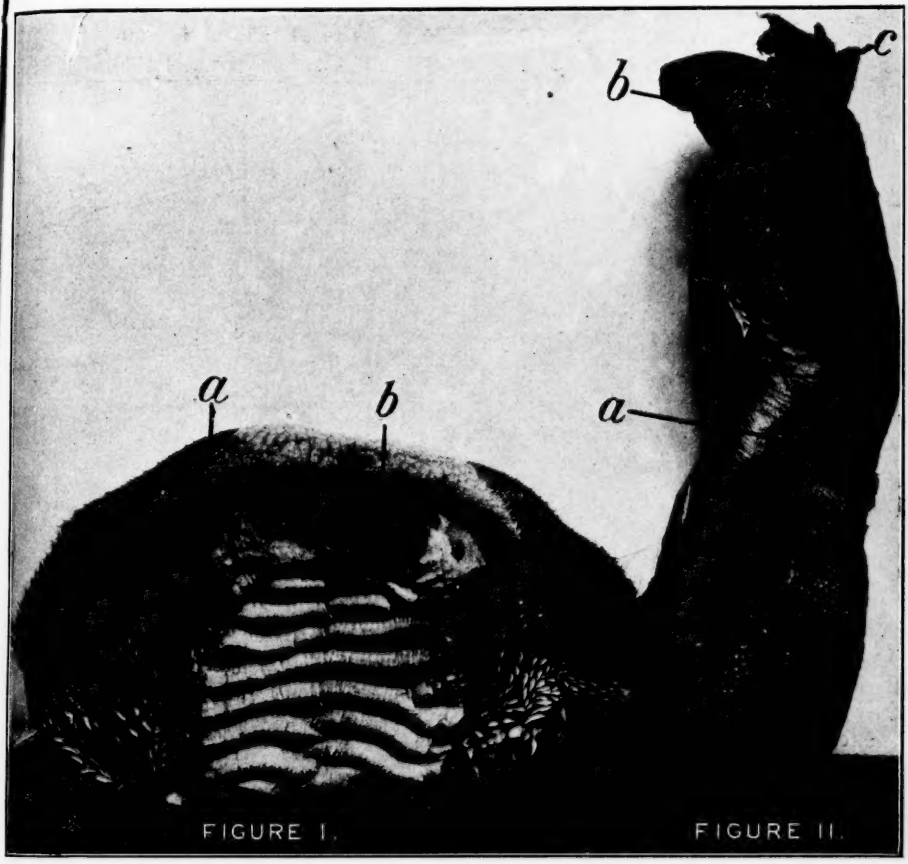


FIGURE I. FIGURE II.

Dental pad and portion of palate of cow with foot-and-mouth disease. *a*, small ruptured vesicle; *b*, erosion of mucous membrane, following rupture of vesicle.
Tongue of cow with foot-and-mouth disease. *a*, unruptured vesicle; *b*, large ruptured vesicle; *c*, portion of epithelium still adhering after rupture of vesicle. (Group No. 1.)

Department, as an additional precautionary proceeding, prohibited the slaughter of animals and the movement of carcases within the district, unless a licence for the slaughter or movement had been granted by an inspector or other officer authorized by the Department for the purpose. But this particular prohibition was not enforced in connection with the majority of the subsequent outbreaks of the disease which occurred in other parts of the country.

The Fifteen Miles Radius of Scheduled Districts.

In the cases of the later outbreaks also the scheduled districts were of smaller proportions than at first. The extent of country —four counties—scheduled on the occurrence of the first outbreak at Swords was unusually large. The Department at that time had strong hopes that the disease might be confined within the Swords area, and they accordingly did not hesitate to proclaim a very extensive district, so as to shut off the affected locality as completely as possible from the rest of Ireland. But it became evident once the disease had ceased to be confined to a single district and become sporadic, that it would not be practicable to maintain so large areas under restriction. In nearly all the later cases, accordingly, districts having a radius of about fifteen miles from the seats of disease were scheduled. The radius of fifteen miles, it may be mentioned, is that fixed by the British Board of Agriculture in the first instance on the occurrence of an outbreak in Great Britain.

The Hay and Straw Movement Prohibited Areas.

The first of these were the prohibited areas as regards which not only movements of animals, but movements of hay and straw, were debarred by the Order of the Department. The Department's Orders dealing with these areas required that no hay or straw should be moved out of the areas, or be moved along, over, or across a highway or thoroughfare within the areas, except when a licence for such movement had been granted by an inspector of the Department or other authorized officer. The prohibited area in the Swords district embraced a wide region, covering five electoral divisions. But in other cases the areas generally extended only from about three to five miles from the infected farms or premises. These areas were kept under specially rigid supervision by the Department's inspectors and

Foot of cow with foot-and-mouth disease. *a*, ruptured vesicle at inter-digital space. (Group No. 1.)

the police. And when, in process of time, the favourable course of events rendered practicable the removal of restrictions from the major part of the scheduled district, the prohibited areas were excepted, and continued under movement restrictions for some weeks longer.

The Infected Places.

The innermost areas, which were subject to the severest restrictions of all, were the infected places.

On the confirmation of an outbreak of foot-and-mouth disease, the premises or lands on which the outbreak had taken place were immediately, by order of the Department, declared to be an "infected place." The regulations which apply to an infected place are very stringent. No animal may be moved into or out of the infected place, unless a licence for the movement be granted by an inspector of the Department or other authorized officer. The carcases of animals may not be removed from the infected place without written permission of an inspector or other authorized officer, and likewise, fodder, litter, dung, utensils, pens, hurdles, &c., may not be taken from the place without such permission, which is not in any case granted until the things to be moved have been thoroughly disinfected. No person (except the person tending the animal) is allowed, unless specially authorized, to enter any shed, field, or other part of an infected place in which a diseased or suspected animal is or has recently been kept; and any person permitted to enter any such field, shed, or other place, must, upon leaving it, thoroughly wash his hands with soap and water and disinfect his boots and clothes. A person tending a diseased or suspected animal is prohibited, except with special permission, from tending any other animal which is not diseased or suspected.

The Police Cordon.

As already mentioned, the necessary protective and precautionary measures were carried out through the agency of the Royal Irish Constabulary. A body of police—a *cordon sanitaire*—in constant touch with each other, and for the most part provided with bicycles, kept close and incessant guard round the neighbourhood of the infected places. So strict was the watch kept by the police that an observer of their patrol could not fail to recognize how difficult it would be for any unauthorized

Tongue of cow with foot-and-mouth disease. *a* and *a*, erosions of mucous membrane after rupture of vesicles. (Group No. 2.)

person or any animals to pass into or out of the forbidden area without instant detection.

The House-to-House Inspection.

A number of the veterinary inspectors who had proceeded to Swords promptly began a diligent house-to-house and farm-to-farm inspection of all animals in the vicinity. This was carried out most thoroughly, the area of inspection being daily widened, and it resulted in the discovery by the inspectors of cases of foot-and-mouth disease on several farms in the district.

This form of local inspection was carried through at all places where foot-and-mouth disease broke out. All animals inspected were carefully "mouthed" (*i.e.*, their tongues, palates, and lips were critically examined for symptoms of the disease) and a record was made of the numbers and kinds of animals on the various farms, in view of the possibility of surreptitious movements. The staff of inspectors engaged on this work was quite distinct from the staff on duty in the infected places.

The Slaughter of Diseased Animals.

The slaughter and burial of diseased and in-contact animals was conducted on the lines now to be described, and entailed a large amount of labour and expense. Butchers were specially employed for slaughter purposes, and a gang of labourers for the digging of pits and burial of carcases. The method of slaughter employed in the case of cattle was shooting. Sheep and pigs were killed in the usual manner. The carcases were covered with lime, and deeply buried in large pits which were dug at suitable places. Quicklime was scattered on the surface of, and around, these pits. Portions of the carcases of quite healthy cattle and sheep were, however, sold to meat dealers. But the hides of all animals were invariably buried, in view of the possibility of their carrying infection, even though the animals might themselves show no signs of disease. No attempt was made at Swords to salvage pigs, as only a small proportion were really good fat animals, and facilities for scalding, &c., were not available. When animals were slaughtered in connection with outbreaks which occurred at other places later on, it was found possible to salvage all the carcases except those actually diseased. In all cases the owners of slaughtered cattle were awarded fair compensation for their beasts, on the valuation of a competent valuer.

Disinfection of Infected Places.

All practicable and necessary steps were taken for the disinfection of premises and lands on which disease had broken out, and no measure that experience or care could suggest for providing against a recurrence or extension of the disease in the district was left unaccomplished. Farmyards, and all such places on which diseased animals had been, were thoroughly disinfected with Jeyes' Fluid. The same disinfectant was freely used in byres, sheds, &c., and these were, in addition, fumigated by burning sulphur. Limewash was then applied to all parts of them, and all litter, dung, &c., remaining in such places was mixed with quicklime. The fields in which the animals had grazed were carefully strewn by machines with newly burned lime.

Disinfection of Hay by Super-heated Steam.

Stacked hay is obviously a very probable place of lodgment for disease germs, and all stacks of hay on farms near the scenes of outbreaks at Swords were disinfected by the agency of superheated steam. This method of disinfection which, so far as the Department are aware, had not been previously used in Ireland, proved very effective. Steam was injected from an engine into the ricks to a depth of 1½ to 2 ft. The heat penetrated to a distance of over 3 ft. Repeated tests with a thermometer showed a temperature of 220° F. The process did not damage the hay in any way for marketing purposes. On examination on the day after steaming the hay was found to be quite dry, and the only evidence of the treatment was that the outside of the ricks showed a brownish appearance as if the hay had been boiled.

Disinfection of Persons.

All persons who had any dealings with diseased animals, or were required or allowed to enter infected places, were carefully disinfected before leaving. The Department's inspectors and the police and labourers never came away from these places without disinfection by sulphur or Jeyes' Fluid. Disinfecting boxes of a suitable kind, in which sulphur candles were burned, were specially provided. High rubber boots and overalls, which could easily be washed with disinfecting fluid, were worn by the inspectors, butchers, and others when on duty. In cases of vehicles leaving the infected places, the wheels of the vehicles and the horses' feet were washed with Jeyes' Fluid. Tools used in slaughter were

disinfected, and tins containing a strong solution of Jeyes' Fluid were placed about in fields where any operations were being conducted, so that all persons who had authority to enter these fields could readily disinfect their hands, clothing, boots, &c. The butchers were supplied with extra suits of clothes, so that they should not leave the infected places in the same clothes in which they had been working.

So long as foot-and-mouth disease existed in Ireland or in Great Britain, the Department kept in operation very thorough arrangements for the disinfection of persons landing in Ireland who had been in contact with animals on board ship in transit to or from Great Britain or in any part of Great Britain. At all the Irish ports such persons were required on arrival to disinfect themselves and their clothes. Materials were provided for this purpose, and a staff detailed to look after the matter.

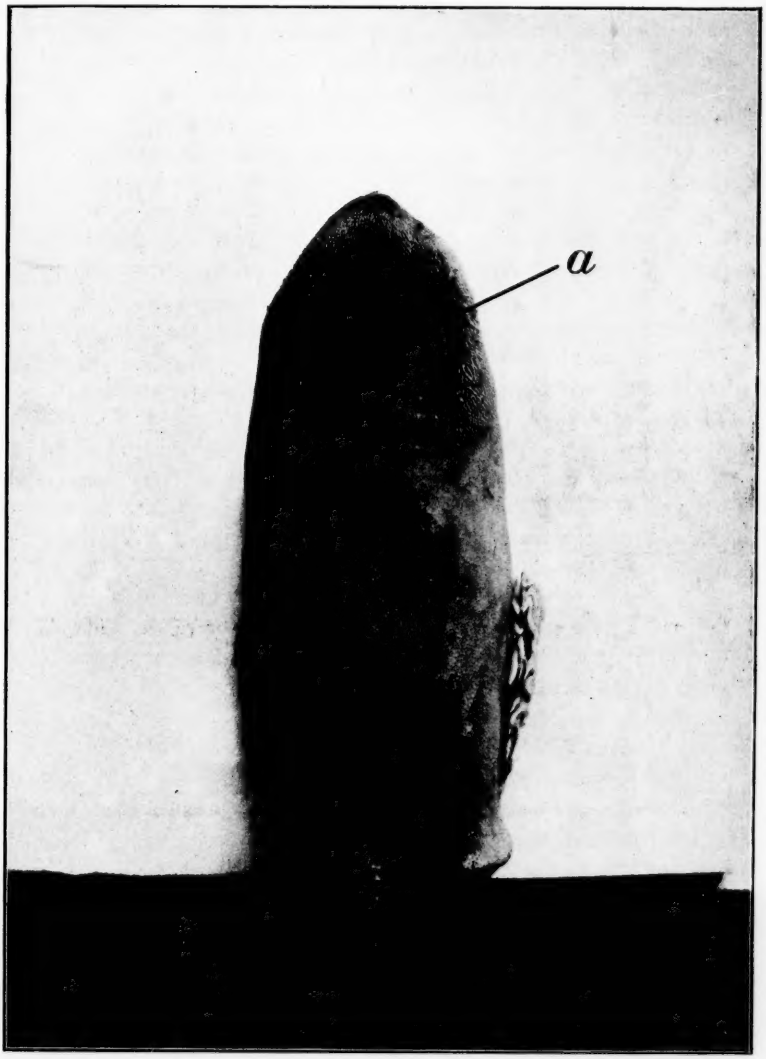
Poisoning of Foxes, &c., at Swords.

It appeared to the Department that foxes in the neighbourhood of Swords might be a probable means of carrying the disease, and consequently poison was laid with the object of destroying these foxes. For the same reason persons residing on or near infected places were required to confine their dogs.

Efforts to Discover Origin of Disease at Swords.

The Department made all practicable efforts to discover the origin of the disease at Swords. It is true that an outbreak had occurred at Penrith, in Cumberland, on June 24—some days previous to the Swords outbreak—and it is possible that the infection may have been conveyed to Swords by drovers, dealers, or others returning to the district from the North of England. But no definite evidence to establish this connection was forthcoming.

The possibility of hay and other feeding material and straw being a source of the infection was particularly investigated. It was stated that a diseased cow belonging to a Mrs. Weldon, who lives near Swords, had been bedded in straw which had been imported into Ireland as packing material, but on inquiry it was found that Mrs. Weldon's cow was visibly affected with the disease before being brought into contact with the foreign straw. It was further reported that manure from the Army Remount



Part of tongue of bullock with foot-and-mouth disease. *a*, erosion of mucous membrane, following rupture of vesicle. (Group No. 3)

Depôt at Lusk had been conveyed to Swords, and that foreign fodder or litter had been used at that Depôt. But the officers at the Depôt assured the Department's inspectors that no foreign fodder or litter was used there, such material being obtained from the local farmers, and it was also found on inquiry that no manure from the Depôt had been brought to Swords. The matter of the movements of men as a probable means of carrying infection was also looked into, but with a negative result. The Department were further informed that foreign hares had been procured and liberated in the vicinity of Swords, but inquiries disclosed the fact that these were not foreign hares, but had come from County Longford.

Many other and varied suggestions as to the cause or origin of the disease were proffered almost daily, in communications to the Department and to the newspapers. Mice, birds, mushrooms, bulbs from abroad, foxes and sundry other animals and things were suggested. All suggestions and suppositions which seemed to the Department to indicate probable sources of the disease were closely investigated, but no clue to its origin was discovered, and this matter remains, and apparently must always remain, a mystery.

Numerous alleged cures for the disease were also propounded, but as no cure which would remove infection or render animals immune is yet known to veterinary science, these suggestions were not very useful.

Packing Material as a Possible Means of Spreading Disease: Department's Warning.

The risk of foot-and-mouth disease being spread by hay and straw used for the packing of imported goods, coming from foreign countries where the disease is prevalent, was one to which the Department considered it important specially to direct the attention of the public. This question had been under the consideration of the Departmental Committee appointed by the President of the Board of Agriculture and Fisheries to inquire into foot-and-mouth disease in Great Britain. In their report, issued last year, the Committee pointed out that numerous imported articles are packed in hay or straw, and that a large proportion of this packing ultimately reaches farms as manure. The Committee considered that this packing constitutes a source

of danger, but in view of the serious dislocation of general trade which the prohibition of its use would entail, they were not prepared, without further evidence, to advise that course. They recommended, however, that persons using such hay and straw should be warned of the element of danger which it contains, and of the risk of allowing it to come into contact with any animals. They also advised that, where possible, it should be burned.

Cases of Foot-and-mouth Disease in England Attributed to Irish Origin.

During the course of the Irish outbreaks in July and August the Department received from the Board of Agriculture and Fisheries several reports of cases of foot-and-mouth disease at places in England, which were said to have occurred amongst cattle shipped from Ireland. These cases were exhaustively investigated by the Department, but no evidence was forthcoming in connection with any of them to indicate that the animals were suffering from foot-and-mouth disease at the time of export from Ireland, nor was any trace of the disease found at any of the farms from which they came, or amongst animals which had been in contact with them.

Special Movements on Licence for Breeding Purposes, &c.

During the months of September and October the Department arranged extensively for permitting movements of animals on licence to Counties Dublin, Kildare, Meath and Louth for breeding purposes, and for the movement of animals to bacon factories, and of milch cows to pastures or dairy yards within certain parts of the scheduled areas. Steps in this direction had become requisite for the relief of stock-owners, breeders, and dairymen living within those areas who were suffering heavy losses through the foot-and-mouth disease restrictions. The Department, therefore, arranged for the attendance of veterinary inspectors at sundry fairs in Central, Southern and Western Ireland, with the object of their issuing licences for these movements. Large numbers of animals were moved from the fairs (which included the great October fair at Ballinasloe) after veterinary inspection. Animals were not, of course, allowed to be brought to localities near infected places.

THE NEWRY-BIRKENHEAD CASES.

On December 4 news was received from the British Board that their veterinary inspector in charge at Birkenhead had that day discovered a case of foot-and-mouth disease amongst a consignment of Irish cattle landed at that port from Newry, and that the Board had in consequence entirely prohibited the landing of animals in Great Britain from any port in Ireland pending investigations.

On the following day the Board reported that on completion of the inspection of the cargo at Birkenhead four additional cattle had been found affected with the disease. Immediate inquiries as to the places of origin of the animals concerned were undertaken by the Department. The cargo had been shipped from Newry on the s.s. *Iveagh*, and had consisted of 73 cattle. 143 sheep, and 525 swine. No disease was discovered in the sheep or swine. The places that the 73 cattle came from were ascertained without delay. They were situated in Counties Armagh, Tyrone, Monaghan, and Down. A thorough examination (including, of course, "mouthing") of all the animals which could have come in contact with the seventy-three which were exported was made, without discovering any case of foot-and-mouth disease.

At the request of the Department the Board of Agriculture and Fisheries forwarded to Dublin the tongue and lips of the first bullock detected, as well as the lips of the remaining four cattle said to be affected. These were examined by four of the Department's inspectors, all of whom are veterinary surgeons of considerable experience, and these officers reported that they failed to find any lesions on them which they would consider to be those of foot-and-mouth disease. The tongues showed elevations and peeling off of the surface epithelium, but these were not, in the opinion of the four veterinarians who examined them, of the character met with in foot-and-mouth disease.

The Question of Portal Inspection at Newry.

In connection with this shipment people naturally asked how it came about that animals with disease marks on the tongues passed the Portal Inspector at Newry. Questions were addressed to the Vice-President in the House of Commons on the subject, which pointed to the fact of the suspicious case at Dublin port having been detected, while these were not noticed. The matter

is easily explained. The animals shipped from Newry were fat cattle, and in accordance with the arrangements which had been made with the Board of Agriculture and Fisheries, it was not then the practice to "mouth" fat cattle, which were intended for slaughter immediately after arrival at the foreign animals wharves. "Mouthing" was confined to store cattle, which would be moved, after a period of quarantine, to other places in Great Britain. The animals detected at Dublin were stores, and the suspicious appearances on their tongues were discovered during "mouthing." The fat cattle shipped at Newry were under the observation of the Portal Inspector—a veterinary surgeon of twenty-eight years' experience—for more than three hours, but none of them exhibited any external symptoms of disease.

The "Peeling-tongue" Cases at Armagh.

In the process of inspecting the animals on farms from which the cargo shipped from Newry came it was found that four out of seven cattle on a farm at Luggyvallen, near Armagh, showed a peeling off of the surface epithelium of the mouth of the same kind as that observed on the tongues and lips of the cattle detected at Birkenhead. It was from this particular farm at Luggyvallen that one of the cattle found diseased at Birkenhead came. These animals were examined by five veterinary inspectors and by Professor Mettam. At the time of inspection six of the seven cattle were affected in the manner described. There were brown-coloured markings on the tongues, and a thin layer of surface epithelium was peeling off in patches from the tongues, and in some cases also from the lips, without, however, exposing the corium in any place. No vesicles appeared, and no soreness of the tongues or other parts of the mouths. The affection could not be observed without opening the animals' mouths. There were no feet lesions. Constitutionally the cattle showed no change from their normal and natural state, and they did not seem to be inconvenienced in any way by this ailment. It was agreed by all the veterinary surgeons who examined them that these cattle were not subjects of foot-and-mouth disease. A similar condition of the mouths was found in two cattle on a farm near Loughgall, County Armagh, which was also the place of origin of one of the affected animals sent to Birkenhead.

(*To be continued.*)

ŒDEMA OF THE WATTLES OF FOWLS DUE TO AN ORGANISM OF THE PASTEURELLA GROUP.

By H. R. SEDDON, L.V.Sc.
Assistant in Veterinary Pathology, Melbourne University Veterinary School.

THE following paper gives an account of an investigation made in reference to the cause of a condition affecting the wattles of fowls, and, as will be seen from the results of this work, there is reason to believe that it is due to a pasteurella, and further, is probably but a form of chicken cholera.

This latter disease, as one knows, is fairly common in certain parts of Australia and New Zealand, and causes a greater or lesser mortality in nearly every poultry yard at some time or other.

Although all the cases under review were all obtained from one property, this form of disease has also been noted on other properties near Melbourne, but unfortunately a full investigation has not, so far as I am aware, ever been made here, nor can I find reference to any similar affection in fowls in the literature I have searched.

HISTORY.

A poultry-keeper in one of the outer suburbs of Melbourne called at the Melbourne University Veterinary School during the middle of 1912 regarding a diseased condition affecting the wattles of some of his birds. The disease first appeared about three years ago, but was not extensive until the autumn, when the owner had over fifty birds affected, the mortality being about 5 per cent. Up to this time the disease had been confined to certain pens of young cockerels, and occurred chiefly during the early winter months. The symptoms shown were sudden enlargement of the lobes, due to more or less distension with fluid with usually no systemic disturbance, followed by gradual absorption of fluid and thickening of the wattle by fibrous tissue with, in some cases, nodules of necrotic material in the tissue beneath the mandible. Necrotic material also frequently forms immediately under old scars such as acquired by birds when fighting, but in this case, although sharply marked off from the healthy tissue, it is rarely cast off, and lies embedded in fissures on the surface of the now very much crinkled wattle.

The owner had attempted treatment by means of setons and

removal of the necrotic tissue as formed, and had met with some success, but the disease was a serious matter for him, not so much from the death of birds as from the great disfigurement produced in the large and showy wattles of valuable birds.

Following an investigation of the subject and the contagious nature of the disease having been demonstrated, the owner was recommended to clean up thoroughly and disinfect his yards and houses, to segregate or kill affected birds, or to have their wattles "cropped." After the adoption of these precautions the owner suffered no loss for some months, when he again brought in some affected birds (hens). These had had a large run, but the owner dug it up and top-dressed with lime those parts where the fowls congregated chiefly near the entrance to the fowl-house, and segregated the affected birds. This again has resulted in a disappearance of the complaint.

Birds Affected: Probable Method of Infection.

These were all pure-bred White Leghorns, and the first two brought were fine, well-grown young cockerels with large comb and very large wattles, the latter being from 2½ to 3 in. long and broad in proportion. When feeding they brushed along the ground, and as will be seen later, this probably provides the means of infection through either scratches obtained when brushing against sharp objects or received when fighting.

The hens brought later were also young. Though their wattles were, of course, not so large, they would be liable to infection in a similar manner.

Cause.

From all the birds, with the exception of one hen which had been affected for some weeks, we have isolated a coccobacillus indistinguishable from that of chicken cholera, both culturally and in its pathogenicity, and with which, further, we have been able to produce the disease experimentally. Chicken cholera is very prevalent around Melbourne, and frequently fowls bought in the open market are found to show more or less immunity to pasteurella inoculation, at least in small doses.

Natural Cases.

No. 1.—Cockerel. Ailing three days.

Both wattles were œdematous, the lower third of the left being cold, partly gangrenous, livid in colour, sharply defined, and there

was some clear œdema exuding from the surface. There was a scab on this wattle, evidently representing a recent injury. Both wattles were considerably thickened ($\frac{1}{4}$ in. thick), the edges rounded, hot except for the gangrenous portion, and hung down for about $3\frac{1}{2}$ in. from the mandible. The tips of the comb were also livid and slightly œdematous.

The bird was dull, appetite gone, feathers ruffled, and it sat huddled in a corner of the box and presenting a very dejected appearance.

The following day the bird was found dead, and *post-mortem* examination made some hours after death showed no lesions apart from those affecting the wattles. These were extremely œdematous from tip to base, uniformly affected but for slightly greater thickness at tip, to which the fluid had partly gravitated. On incision a clear fluid readily exuded from the surface and the wattles were readily compressed almost to normal thickness, there being little new fibrous tissue.

Smears from the œdema showed on microscopical examination many coccobacilli (often like small diplococci), apparently pure. Other organs, including the blood, showed no organisms or spirochætes.

Agar cultures from the œdema showed in twenty-four hours a profuse growth of small translucent dew-like colonies of coccobacilli and two colonies of *Staphylococcus albus*.

Pipettes of heart blood on inoculation showed many coccobacilli varying somewhat in form and size, but showing distinct bipolar staining. Cultures showed the same organisms as was present in the œdema, apparently pure.

Sections of wattle showed on microscopical examination much œdema of subcutaneous tissue beneath the blood sinuses with some blood extravasation from one or two blood spaces near edge. Numerous coccobacilli present in œdema and a few in blood, but no other organisms detected.

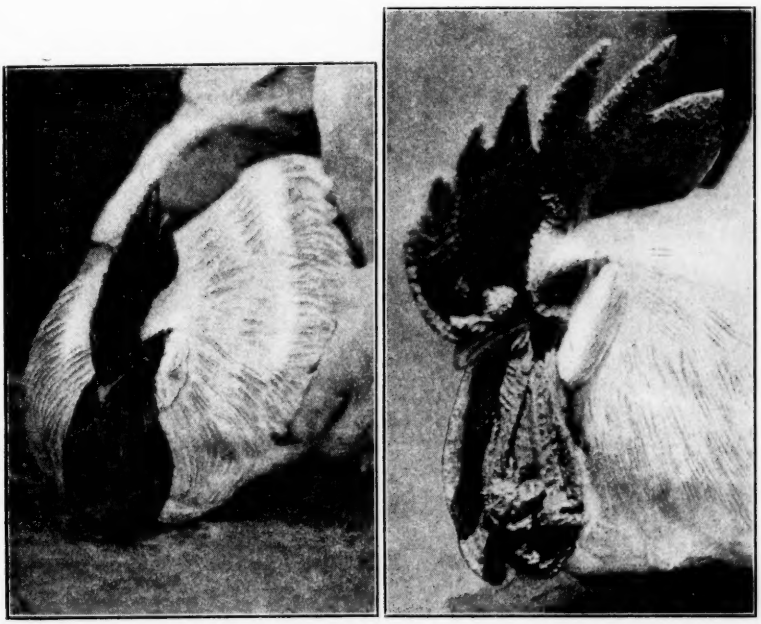
No. 2.—Ailing three days.

The left wattle was swollen, hot and œdematous, and there was on the surface a small line of scab, such as results from a scratch. The other wattle was normal, and remained so throughout observation.

This bird manifested no systemic disturbance and so was kept for observation. During this time the following changes

in the wattle were noted. Fourteen days after admission the scabs showed some tendency to slough off; portions could easily be pulled off while a serous material exuded from the edges of the wound on pressure. Examination of this fluid revealed the presence of coccobacilli. The wattle was now firmer to the touch and not hotter than normal.

The tissue at the base of the wattle became somewhat indurated, and later a small nodule could be felt there. This nodule



FIGS. 1 and 2. Case No. 2.—Photographs of affected wattle at intervals of 3 months.

gradually implicated a small portion of skin on the outer surface, and thirty-eight days after admission this was followed by the attempted sloughing off of the necrotic skin and nodule underneath. The attempt, however, was only partly successful, as three weeks later it was noted that the scabs seem to recede into the wattle and, apart from one or two scabs, sloughing off show no tendency to resolution. The wattle therefore became

XUM

corrugated, being at its thicker portions still ⅜ in. thick (see photograph, p. 27).

Three months later (see photograph) the necrotic masses are found to be embedded in sinuses in the thickened wattle. Removal shows a hole right through the wattle. The line of demarcation between the live tissue and necrosed material is sharply marked off. The wattle, though retaining its normal colour, is now quite dense to the touch, and the bird, though

FIG. 3. Case No. 3.—Hen.

affected for five and a half months, has never manifested any general symptoms of illness.

Five months after this bird was received here it received a subcutaneous injection of virulent culture (see Rabbit 89 and Fowl 5), but remained normal.

Five months after the previous cases were brought under notice the same owner presented three hens for examination.

No. 3.—Hen. Affected about a month (see photograph).

Right wattle ovoid in shape, measuring about 1 in. long by ¾ in. wide, and being ½ in. thick. There were old scars on the inner surface, from one of which a fluid, slightly milky in appearance, exuded on pressure. On the outer surface there is an old cicatrix with shrinking of the surrounding skin.

Left wattle was the size of a walnut, spherical in contour and about 1 in. in diameter. The edge was rounded and not apparent except for a line in the skin.

Both wattles were of a normal colour, slightly hot, œdematous, but fluctuating in parts. Between the wattles (that is, in the intermaxillary space) an irregular hard mass the size of a pea was to be felt.

Inside the lower lid of the left orbit was a small bladder-like structure the size of a pea, freely movable, and with fluid contents whey-like in appearance. The comb was not affected. Smears of fluid within the wattles showed numerous organisms, chiefly coccobacilli.

It was doubted at first whether this spherical phase with whey-like fluid was of the same nature as the other cases, but in view of the statement of the owner that the bird was at first affected with the purely œdematous form, that a few others have been similarly affected, and that on cultures the same coccobacillus was recovered, leads one to the conclusion that this case ought to be mentioned here, and that the apparent atypical lesions were due to the presence of other organisms, as noted above.

No. 4.—Hen. Ailing four days (see photograph, p. 30).

Right wattle was much enlarged, edges rounded and ¼ in. thick. Œdematous, tense and hot. No evidence of injury.

Left wattle enlarged to two-thirds the size of the right, edges rounded. There was an old abrasion on the inner surface. On the outer surface was an area of purplish discoloration, 1 in. long by ¾ in. wide, extending upward from the tip of the wattle, which is livid. This coloration ends abruptly. The wattle was firmer and not so œdematous as the right. The comb was slightly œdematous at the base.

Smears of œdema obtained by puncture with a pipette show numerous coccobacilli, which were obtained in pure culture on agar inoculated therefrom.

No. 5.—Hen. Affected about a month.

Right wattle was shrunken and much wrinkled about old

FIG. 4. Case No. 4.—Hen.

FIG. 5. Case No. 5.—Hen.

abrasions, now represented by fissures containing necrotic material. No œdema. There was a hard mass at the base of the wattle.

Left wattle was thickened to ¼ in. Edges rounded. Two old abrasions, one on inner the other on outer surface. The wattle was firm to the touch and still rather hotter than its fellow. The skin was commencing to shrink. No œdema was obtainable on puncture.

From these three hens the wattles were removed by the knife. In Nos. 3 and 5 the necrotic mass at base was found to extend into the intermaxillary space. It was surrounded by little fibrous tissue, irregular in contour, very hard, almost horny, and of a yellowish-brown colour. Smears showed only dead tissue elements and no organisms. The birds recovered, and though thus mutilated do not seem to suffer any discomfort.

EXPERIMENTS.

Pigeon.—Inoculated in pectoral muscles with two drops emulsion of agar culture from œdema of No. 1, and died in about forty hours. *Post-mortem* examination showed slight necrosis of muscle at seat of inoculation, congestion of intestines, otherwise all organs appeared normal. Microscopical examination of blood showed numerous coccobacilli.

Rabbit 83.—Inoculated subcutaneously with 0·5 c.c. of broth culture from blood of pigeon. Died in about twenty hours, and on *post-mortem* examination showed typical lesions of pasteurellosis. Microscopical examination of heart blood showed numerous coccobacilli.

Rabbit 89.—Inoculated with 0·25 c.c. first subculture twenty-four hours old on broth from œdema of Fowl No. 4, and succumbed in eighteen hours, *post-mortem* examination showing marked infection of all vessels, with small hæmorrhages in muscles, congestion of liver and kidneys, &c. Smears from heart blood showed numerous coccobacilli.

Fowls.—E. F., 1—Rooster, Barred Plymouth Rock. (This bird had been kept at the School for the past month, during which time it had manifested no illness.)

With emulsion of agar culture from œdema of No. 1 smeared wattles on left side, and on right side after lightly scarifying with needle.

The following day the bird was dejected, plumage ruffled, slight diarrhœa. Wattles normal, except for small blood scabs along lines of scarification. The next day, however, the right wattle was hot and slightly œdematous, especially at part where it joins the head. There was intense conjunctivitis of the right orbit, the lids being closed, and the peri-orbital tissues very œdematous. The left wattle was also hot, but not œdematous, and the comb was hot and slightly œdematous. The bird was off its feed, dull, walked with staggery gait, tail turned to one side. Diarrhœa persisted and the temperature was raised.

Two days later the wattles felt cold, clammy, and there was œdema at the base. Conjunctivitis lessened. The bird continued during the next two days to show diarrhœa and dulness and ate but little. The lower portions of both wattles became livid and small beads of œdema exuded from the surface, but the wattles were not much thickened.

On the seventh day after inoculation the bird appeared much the same, but the wattles thickened, due to œdema, especially at the lower edge. The eye was still closed.

Thereafter the general condition of the bird improved, the wattles for the next week were œdematous and cold, later becoming normal, and a small indurated mass could be felt inferior to the right orbit.

The bird was then placed in a pen which had been occupied by Case No. 2. This pen after its previous tenant had purposely been left uncleaned, and the droppings of the fowls were mixed with ashes and the grain mixed along with this.

No results followed till a week later, when marked œdema of the infra-orbital subcutaneous tissues was again noted. This œdema spread round lower jaw to the base of the wattles.

Fourteen days after placing in this pen the bird was killed. *Post-mortem* examination showed dense necrotic mass, size of a split pea, just below the orbit, the surrounding tissue being somewhat œdematous.

Smears and cultures from the edge of the necrotic material showed coccobacilli.

E. F., 3.—Rooster—Game cross.—The left wattle was lightly scarified, and one drop of a twenty-four hours' old broth culture from pigeon was rubbed into the lines.

Two days later the lower edge of the wattle was thickened

and œdematous, forming a triangular area with apex at the end of one of the scars. This swelling gradually increased in size till it measured about half an inch along each side, and remained so for about five days, after which it receded slightly from the periphery of the wattle. At the end of a week the scars rapidly healed, the fluid became absorbed, and the swelling gave place to a shot-like body, with little fibrous tissue surrounding it, within the tissue of the wattle. This shot-like nodule gradually became degenerated and of a yellowish-brown colour.

Two months later the experiment was tried on the other wattle, but the bird did not become affected, nor did it succumb to a subcutaneous injection of virulent culture (see Rabbit 89).

A month later the animal was killed, when the nodule was found to be similar in appearance to that met with in the deeper parts of the wattles of natural cases.

E. F., 5.—Hen.—Inoculated in pectoral muscles with 0·25 c.c. culture as used for Rabbit 89, and succumbed in twenty-four hours, *post-mortem* examination showing little beyond congestion of all organs and blood extravasation at seat of inoculation. Microscopical examination showed numerous coccobacilli in tissues at seat and in the blood, especially after incubation.

Summary of Experiments.

Pigeon, Rabbits 83 *and* 89.—Subsequent inoculation of culture. Result: Death (pigeon, forty hours; rabbits, eighteen and twenty hours). *Post-mortem* examination characteristic of pasteurellosis. Coccobacilli numerous in blood, &c., especially after incubation.

Fowls.—E. F., 1.—Scarification and rubbing in of culture. Result: General illness, conjunctivitis, œdema of wattle, diarrhœa, formation of necrotic material, and when killed fourteen days after inoculation showed little change, apart from lesions in head, from which latter the coccobacilli were recovered.

E. F., 3.—Scarification and rubbing in of culture. Result: Œdema; necrosis. Immunity to subsequent scarifications and a subcutaneous inoculation of virulent culture.

E. F., 5.—Subcutaneous inoculation of culture. Result: Death. *Post-mortem* examination: Congestion of organs, &c.; coccobacilli in blood, &c.

E. F., 2.—Immunity to subsequent injection of culture.

SUMMARY.

(1) The breed affected in the cases under review was White Leghorn, but probably any breed with large wattles would be liable to the complaint. It has been produced experimentally in other breeds of fowls.

(2) In natural cases or following scarification and rubbing in of culture the first symptom noticed is the rapid swelling of the wattles, due to the presence of œdema, which may also be found exuding from the surface.

(3) Septicæmia and death occurs in a certain percentage of cases.

(4) The disease usually runs a chronic course with subsequent replacing of the fluid by fibrous tissue, formation of nodules of necrotic material, and results in the wattle assuming a crinkled appearance.

(5) Cause, a pasteurella, apparently identical with that causing chicken cholera. Produces a septicæmia with early death on inoculation into pigeons and rabbits.

(6) Entrance is probably through wounds obtained while scratching, fighting, &c.

(7) Immunity is attained in chronic cases, which, however, are probably capable of acting as "carriers."

(8) Cases amenable to treatment by "cropping" of the wattles.

(9) Adoption of sanitary measures of benefit in suppression of the disease.

TUBERCULOSIS IN DOGS.

BY L. B. BULL, B.V.Sc.
First Assistant, Government Laboratory, Adelaide.

RECENTLY, while working as a research scholar at the Melbourne University Veterinary School, I had the opportunity of holding *post-mortem* examinations on two cases of tuberculosis in canine patients.

In view of the fact that tuberculosis is regarded as somewhat rare in the dog, and considering the atypical symptoms and lesions present in both cases, I consider that it is of interest to place on record the following observations.

In neither case was there any rapid progressive cachexia, as is said to be the most constant symptom in dogs, nor was there any cough. In both cases the most pronounced symptom was ascites, which developed rapidly in the last week prior to operation. Considering the extent of the infection in both cases and the organs involved, it is remarkable that the dogs did not became emaciated and no symptoms should have developed until the disease was so far advanced.

These facts, combined with the fact that no tubercle bacilli were discovered in the smears made from the caseous areas, although many were examined, made the diagnosis very difficult. It was only by intraperitoneal inoculation of a guinea-pig that I was able to prove the real nature of the disease, and later, after staining many sections by Ziehl-Nielsen's method, I was able to demonstrate in a very few cases the presence of tubercle bacilli in the lesions.

Each case will be dealt with separately, only the main features of the *post-mortem* and histological examinations being detailed.

Case 1.—Bull terrier bitch brought into the hospital to be treated for fracture of the femur. The animal developed ascites a few days later, and showed some general disturbance in health. In about five days the ascites developed very rapidly, when the abdomen became greatly increased in size. It was decided to tap and hold an exploratory operation. The fluid was let out of the abdomen by an incision in the median line. The fluid was cloudy, dirty, and slightly blood-tinged. Roughly, two gallons of fluid were removed. The liver was then palpated and found to possess large nodular masses. The incision was enlarged and the liver observed. There were large greyish umbilicated masses throughout. The condition was diagnosed as carcinoma, and it was decided to destroy the animal.

On *post-mortem* examination the liver was seen to be very enlarged and extensively affected with greyish-yellow nodules, varying in size from a little larger than a pin's head to the size of a walnut. The larger masses, which were umbilicated in the centre, were a little denser in consistence than normal liver tissue, and raised above the surface of the liver. On further examining the organ it was found that an abscess had formed in one lobe and had ruptured, leaving very irregular lacerated edges. The spleen was extensively affected with umbilicated areas about 2 in.

in diameter and raised above the surface of the organ. The lymphatic glands of the region were swollen and contained yellowish necrosed areas. Throughout almost the whole length of the intestine numerous yellow nodules about the size of a pin's head were scattered irregularly. Both kidneys contained nodules in the cortex, varying in size, raised above the surface and greyish-yellow in colour. The lungs were denser than

FIG. 1.—Section of liver with two lesions showing. The streaky degeneration is well shown in the older and larger lesion. Photomicrograph × 72.

normal, and on section were found to contain throughout small translucent greyish areas up to 1 cm. in diameter, or sometimes several agglomerated together to form a larger dense translucent mass. The mediastinal lymph glands showed small greyish-yellow necrotic areas. The heart was normal.

Sections for microscopical examination were taken of all the

organs affected. Histological examination showed lesions of the same character in each organ.

Liver.—A piece of liver apparently normal to the naked eye shows on section numerous nodules of cell accumulation irregular in distribution, but sometimes closely associated with the portal canals. These nodules consist of endothelial (epithelioid) cells, small mononuclear leucocytes, and lymphocytes. The endothelial cells rapidly degenerate. There is no breaking up, but a disappearance of the chromatin, the nuclei losing all staining properties. The cells exhibit a change somewhat akin to fatty degeneration, but there is no breaking up into a fatty granular *débris* as is usual in caseation. The degenerated material becomes reticulate and then streaky, taking the fuchsin stain of the Van Gieson (fig. 1). Later it tends to take more of the picric, but there is always a mixture of the red and yellow. With eosin it takes a uniformly pink stain. Also, when the degeneration is

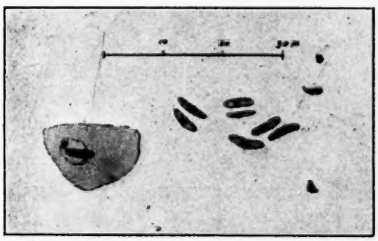


FIG. 2.—Group of spores of some protozoan parasites in the liver of Case 1. (Drawn by aid of camera lucida.)

further advanced, there is an extensive accumulation and invasion of polymorphs. There is also an attempt on the part of the fibroblasts to lay down a loose scanty capsule of fibrous tissue. There is little or no attempt at giant cell formation, only one giant cell being found after numerous sections had been examined. There are numerous small hæmorrhages into the surrounding liver substance, and sometimes small hæmorrhages into the nodules.

Nodules combine, and result in the formation of large areas consisting almost completely of a streaky degenerated material.

It is worthy of record that in one of the liver sections stained

by Giemsa's method a group of sporozoites of some sporozoan parasite was found. These sporozoites are ovoid bodies, tapering at either end, and containing in their centre a definite nucleus which takes on a deep red stain. These spores measure from 5·99 μ to 6·2 μ long, and 1·2 μ to 1·7 μ broad. One spore had entered a live cell and was lying above the nucleus (fig. 2). As yet only one group of spores has been found, and no further stage of the parasite detected.

Kidney.—The same type of lesions as seen in the liver is also to be seen in the cortex of the kidney.

The kidney tubules lose their epithelial lining, leaving empty spaces, which soon become obliterated by the rapidly multiplying fibroblasts and the accumulation of leucocytes at the periphery of the nodules. The glomeruli are more resistant, and one or more are often to be seen very shrunken from Bowman's capsule. The endothelial cells are more loosely packed, and there is less tendency to degeneration than in the liver, although there is a strong polymorph reaction. Many of the larger blood-vessels are sclerotic. There is thickening of Bowman's capsule and a shrinking of the glomerulus in the surrounding kidney tissue. There is no tendency to giant cell formation.

Lymph Glands.—In the lymph glands there is the same accumulation of endothelial cells loosely packed with a very pronounced tendency to early degeneration, the degenerated material being streaky and taking in parts the fuchsin, and in other parts the picric of Van Gieson. There is little or no polymorph reaction. The blood-vessels are congested in the surrounding lymphoid tissue, and there are numerous small hæmorrhages.

Intestine.—Two small pieces of intestine were taken for examination of the small caseous nodules. On section the caseous nodules are found to be situated in the inner and outer muscular coats respectively. These nodules consist entirely of a degenerated (calcareous) material enclosed in a thin fibrous capsule. Probably they are due to the invasion of some metazoan parasite.

The outer muscular coat of the intestine is almost completely atrophied, and its place taken by a typical granulating tissue with capillaries (fig. 3). There is also a large invasion of polymorphs. Between the muscle fibres and at times intra-cellularly are to be seen protozoan-like bodies. These are very delicate, long,

spindle-shaped bodies measuring 17·1 μ to 27·3 μ long, and 5·9 μ to 6·4 μ broad, containing a very finely reticulate protoplasm, with usually one, sometimes two, spherical nuclei situated more or less in the centre, and sometimes to one side (fig. 4). These protozoan-like bodies stain faintly blue with Giemsa. Sometimes their ends, which are very tapering, remain clear. What appears to be a younger stage varies from a spherical to an oval shape,

FIG. 3.—Section of intestine of Case 1 showing atrophic external muscular coat and invasion of round cells. A caseo-calcareous cyst is shown in the internal muscular coat. Photomicrograph × 108.

measures 7·2 μ in the long axis, has scattered chromatin points in a faintly reticulate protoplasm, and stains reddish-purple with Giemsa. The same protozoan-like bodies can occasionally be picked up in the mucous membrane. These lesions are unusual. I can find no record of any similar lesions in any of the literature I have searched.

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It is impossible to be dogmatic about the nature of the cellular bodies associated with the muscle atrophy, but I am inclined to the belief that they are protozoan in nature.

There were no tubercular ulcerations in the intestines, and it is improbable that the lesions described in the muscular coats are in any way associated with the presence of tubercle bacilli in other situations of the body.

Lung.—Sections of the lung show numerous cell accumulations of the same character as those described for the liver. There is a slightly greater reaction of the fibroblasts and a bigger accumulation of lymphocytes, while there is little or no polymorph reaction. These lesions tend to degenerate early, and the caseation is of the same atypical character as seen in all the lesions. Here and there these lesions are closely connected with bronchi, and a commencing ulceration of the mucous membrane can be seen.

Case 2.—A Manchester terrier with ascites was brought into the hospital for treatment. The dog was in good condition, and showed nothing more than a very large and tense abdomen. It was decided to hold an exploratory operation, and that the dog should be destroyed if any extensive liver lesions were present. The ascitic fluid was drained, about a gallon of clear straw-coloured fluid being removed. It was then seen that the mesentery and liver were extensively affected with small caseous nodules. The dog was killed. On *post-mortem* examination the liver was found to be enlarged, and to contain throughout its substance numerous small caseous nodules, while in some places many had united to form larger masses of degenerated material somewhat of the consistence of dough. These areas were raised above the normal surface of the liver, and some showed an umbilicated centre. The hepatic lymph gland showed caseous areas. The mesentery contained a few scattered nodules, while in the region of the pancreas there was a large mass about 5 in. in length and 2 in. in thickness, this being an accumulation of small caseous nodules (see C, fig. 5). The spleen was normal in appearance. Both kidneys showed small caseous nodules in the cortex.

On opening the thorax the pericardium was seen to be greatly distended by fluid. About a pint and a half of clear fluid was removed from the pericardial sac. The heart was seen to contain

a large irregular greyish mass in the muscle of the left ventricle, and smaller areas were situated in different parts of the heart muscles of both ventricles (see E, fig. 5).

The lungs and mediastinal lymphatic glands were perfectly normal. Histological examination shows lesions of exactly the same kind as those in Case 1. In the liver there is slightly more fibrous tissue reaction at the periphery of the lesions, but the cell accumulation and degeneration are of the same character as previously described. The kidney shows the same type of reaction. There is no attempt at giant cell formation, and no calcification of any of the lesions.

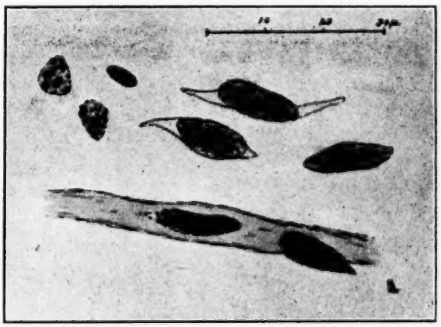

FIG. 4.—Protozoan-like bodies from the external muscular coat of intestine in Case 1. (Camera lucida.)

The heart shows a thickening of the epicardium, in parts of which there are typical cell accumulations and degeneration. Scattered throughout the heart muscle are numerous lesions irregularly spherical or elliptical in shape. These also show early degeneration. The predominant cells are the epithelioid cells situated in the cortex of the lesions and leucocytes, small mononuclears, and lymphocytes towards the periphery. There is no polymorph reaction, and the fibroblasts are more active in the older lesions. The muscle fibres surrounding the lesions are only slightly atrophic.

EXPERIMENTS.

An emulsion of the tissue from the heart lesions was made, and two guinea-pigs and two dogs were inoculated.

Guinea-pig 329 was inoculated with 2 c.c. of the emulsion

intraperitoneally, and guinea-pig 330 with the same dose subcutaneously. Dog 1 was inoculated with 3 c.c. intraperitoneally, and dog 2 with the same dose subcutaneously.

Guinea-pig 329 was dead twenty days after the inoculation. It showed a small amount of fluid in the peritoneal cavity. The peritoneum, particularly on the left side, was thickly studded with numerous greyish nodules, more thickly massed in the superior part posterior to the kidney. The mesentery, the small intestines, and large intestines were studded with nodules, and in the region

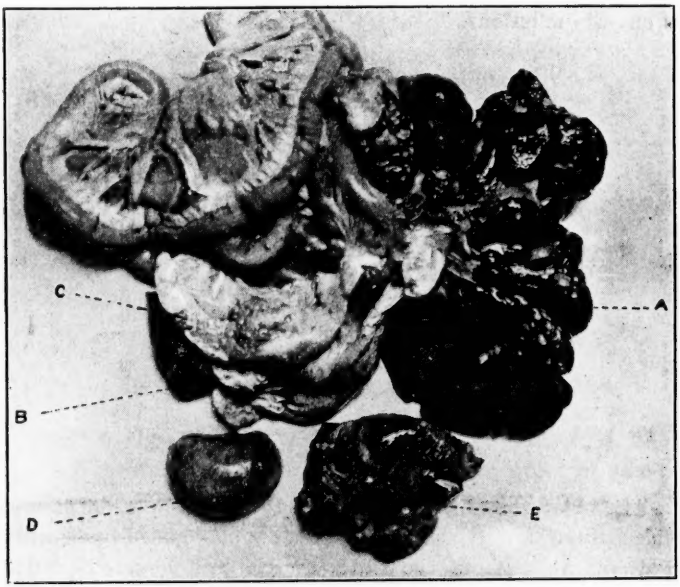

FIG. 5.—Viscera from Case 2. A, liver; B, spleen; C, large collection of small caseous nodules; D, kidney; E, heart.

of the pancreas contained large masses of nodules. The spleen contained many small yellowish-grey nodules throughout. The lymph glands of the region were swollen, and contained larger or smaller yellowish caseous-looking areas. The peritoneum covering the kidneys, testicles, and bladder was studded with typical nodules translucent at the edges, opaque and yellowish in the centre. Three of the supra-sternal lymph glands were large and caseous, while the thoracic viscera was normal; smears show

numerous tubercle bacilli of the human type. Sections show numerous acid-fast bacilli in typical caseous areas. There is also typical giant-cell formation.

Guinea-pig 330 was killed forty-six days after inoculation. The precrural lymph glands on side of inoculation were enlarged, containing caseous areas. Lymph glands in the pelvic region were large and caseous. The spleen and liver contained many greyish translucent areas. Tubercle bacilli were numerous in the lesions.

Dog 1 was killed forty-six days after inoculation. The organs of both cavities presented a perfectly normal appearance. There was one small isolated caseous nodule in the parietal peritoneum.

SUMMARY.

In both cases the chief symptom was ascites.

Liver.—In Case 1 the lesions presented somewhat the appearance of a new growth.

In Case 2 they approached more nearly to the typical appearance of tubercular caseation.

Mesentery.—In Case 1 it was free from infection.

In Case 2 it was extensively involved, reminding one of the sausage-shaped tumour formed by rolled-up matter omentum in tubercular peritonitis of the human subject.

Spleen.—In Case 1 the lesions were large, and showed pronounced umbilication.

In Case 2 it was apparently normal.

Kidneys.—In both cases they were affected.

Lungs.—In Case 1 they contained throughout their substance grey translucent areas.

In Case 2 they were perfectly normal in appearance.

Heart and Pericardium.—In Case 1 they were perfectly normal

In Case 2 the pericardial sac was filled with a large quantity of clear fluid, and the heart muscle was extensively affected.

Degeneration.—In Case 1 the caseation was typical in consistence, but varied greatly in colour.

In Case 2 the consistence was much softer and more doughy than usual.

In neither case was there any calcification of the lesions.

The situation of the lesions varies greatly in both cases. The extensive affection of the heart muscle in Case 2 and the perfectly

normal appearance of the lungs and pleura present a feature of special interest.

These variations in the organs affected and the macroscopic character of the lesions, combined with the absence of tubercle bacilli in the smears, render diagnosis difficult.

Microscopically, the features most worthy of note are: The rapid degeneration of the epithelioid and other cells in the lesions, the atypical caseation produced by this degeneration, the comparative absence of any giant cell formation, and the absence of any marked fibrous tissue reaction.

The fact that the tubercle bacilli were of the human type supports the view expressed by Nocard and others that dogs may become infected by the ingestion of human sputa, vomited matter, or leavings of food, or by inhalation of virulent dust resulting from the drying of the sputa.

The history of the owners could not be traced.

In conclusion, I wish to support the view held by Nocard that ascites, hydrothorax, and hydropericardium in dogs ought to always make one suspicious of tuberculosis, and that diagnosis is best made by drawing off a fairly large quantity of the liquid, centrifugalizing it, and inoculating a guinea-pig intraperitoneally with the residue.

Or an exploratory operation can be made, some of the material from a lesion removed by a sterile pipette, and a guinea-pig inoculated.

VETERINARY HOSPITALS DURING WAR.

By Major R. C. COCHRANE, F.R.C.V.S., A.V.C.

(*a*) Considered Financially.

(*b*) As a Channel for Conveyance of Remounts from the Base to Units in the Field.

The question of the economic value of veterinary hospitals during times of war is a subject which deserves close attention. Until the South African War veterinary officers received inadequate training in veterinary hospital administration, and although the general administration and organization of veterinary hospitals have been considerably improved of late years, it is, perhaps, not out of place to consider what value, more particularly from a financial aspect, veterinary hospitals can be to an army in the field, and the saving that can be made to the State generally.

The figures which I propose to utilize were collected by me during the late South African War (1899-1902) for my own information, in order to arrive at a decision with regard to the

financial relation existing between the value of a sick horse admitted to a veterinary hospital, and the daily expenses entailed by his keep and treatment; also to discover the period of time during which it would be profitable to keep a horse under treatment, or whether it would be more economical to destroy him at once.

Many cases occurred where horses were sent into veterinary hospitals with serious injuries, combined with mange, old age, or some unsoundness, and being curable, veterinary officers did not always look at the case from a financial aspect, but detained the horse so long in hospital that his keep and treatment cost more than he was worth; in some cases the animal had eventually to be destroyed, thereby making the loss still greater. If veterinary officers had appreciated more fully the financial side of their work, it is probable that a considerably greater saving could have been effected.

When a horse is admitted for treatment a mental calculation should be made as to the value of the animal when fit for issue, due consideration being given to the probability of his responding to treatment or not. If this value be placed on the credit side, and on the debit side the approximate cost of his treatment, which is the anticipated duration of his stay in days multiplied by the daily cost of his keep, then by striking a balance it will be seen whether the horse is worth the treatment or not. It must, however, always be remembered that the value of a horse varies considerably with the question of supply and demand, and one must not be too hasty in ordering the destruction of any animal that could be cured, even if only rendered temporarily efficient.

As far as I could ascertain, there were no statistics upon which to form an opinion, and it was therefore almost impossible without lengthy calculations for an executive veterinary officer to form an estimate of the daily cost of the keep and treatment of a sick horse.

My calculations were made on the following lines:—

The various accounts of the Veterinary Hospital at Middelburg, Transvaal, were first carefully examined for the previous six months. During this time the average daily wastage under each heading was taken, valued, and shown as depreciation under separate items, and placed on the debit side in Table I. Wages and rations, at Army rates, of all officers, soldiers, civilians, and natives were also placed on the debit side. In fact, as far as possible, an account, including expenditure and depreciation, was drawn up on business lines.

A very accurate account was kept of all medicines issued to the Veterinary Hospital, and used there. In this item I was able to be very exact, as the Medical Store Depôt and the

Veterinary Hospital, although treated as separate institutions, were both under my care. No charge was made for instruments, as these were returnable to store, but in practice a certain sum should be debited on this account as depreciation.

The prices of horse rations (which may appear excessive) were taken from figures supplied to me by the Army Service Corps.

It is almost impossible to work out to an exact figure the actual daily cost of keep of a sick horse in a veterinary hospital, when the horse population is a floating one, but the average daily number of horses in the Veterinary Hospital quoted during the period taken was as nearly as possible 1,500.

From the figures shown in Table I., the daily cost of keep of 1,500 sick horses with everything included, amounts to £245 11s. 5d. This gives the daily cost of one horse as 3s. 3¼d.; but necessarily this will vary with the increase or decrease of numbers, and it will be easily understood that the fewer the horses the more expensive is the upkeep of the individual animal; and the reverse up to certain limits holds good. This is accounted for by the fact that the same staff is generally allotted to 250 horses as to 500 or more, attendants on the horses not being included.

No charge is made against the Veterinary Hospital for R.E. expenditure, but when these tables were compiled no R.E. expenditure had been incurred. The fencing, flooring of standings, drainage, &c., were undertaken solely by the Veterinary Hospital staff. Later on, during the war, considerable R.E. expenditure was incurred in this veterinary hospital, such as corrugated iron sheds for 500 horses, feeding troughs for all horses, erection of corrugated iron pharmacy, office, forge, forage shed, and messing-shed for men. These were all eventually pulled down, and used for other purposes when the Veterinary Hospital was abolishd, so that actually the R.E. expenditure amounts to the cost of erection, plus the sum allotted by the R.E. for wear and tear of materials which were used or sold later on. Against this may be obviously placed the more efficient treatment and feeding of horses, with the consequent saving of mortality.

It is hardly necessary to point out the reduction in horse mortality when proper feeding troughs and sheds are provided, although this is not possible on service except for permanent base veterinary hospitals. I calculated that in feeding horses off the ground one-third of the grain ration was lost by being trodden under foot, and in wet weather feeding becomes impossible. When large numbers of horses have to be looked after it is impossible to feed them out of nose-bags except in a few

special cases. The loss in hay was considerable, but naturally not so large as the loss in grain.

The erection of shelters (however rough) saves hundreds of thin and debilitated horses; whereas when exposed to the cold winds and rain they die by scores.

Although R.E. expenditure is not shown in my calculation, it may be taken for granted that the sum spent by them later on was fully counterbalanced by the saving effected in animals, and by the shorter time horses were detained in hospitals; as the result of the better conditions these were under, their recovery was more rapid, and they were able to join the ranks sooner, and thus become of value to the Army.

However, I repeat no R.E. expenditure is taken into consideration in this paper, and usually, under service conditions. large R.E. expenditure would not be undertaken unless the campaign was continued a long time, and then only at base veterinary hospitals. Thus, under ordinary service conditions, in a veterinary hospital, the R.E. outlay would not be excessive.

Table I. shows the total daily expenditure in the Veterinary Hospital.

What strikes one particularly on examining the table is the enormous proportion the horse-rations bear to the total. It is held by some that rations for sick horses could be reduced; but usually the standard ration works out well, as the food not consumed by very sick horses is given to those which are thin and require feeding up. The rations, however, are the only item where any saving could be made; it must be remembered that veterinary hospitals are expected to send their patients out fit for duty, and therefore it is very questionable whether any reduction is to be recommended.

The low proportion of the total amount of the daily expenditure on professional and technical staff might certainly be increased with advantage.

The cost of medicine is not excessive.

From a veterinary point of view the cost of medicines is interesting, and it is probable that with careful discrimination the total might be reduced, by not issuing, or economizing *in war time* the issue of the very expensive drugs, and by a freer use of the less expensive. Still, a fifth of a penny per day per horse for medicines is not excessive, and if one takes the average time of detention of a sick animal in a veterinary hospital at two months, the medicine bill would amount to one shilling only.

Table II. is the balance sheet for six months; the figures on the debit side are arrived at by assuming that the average daily number of horses in the Veterinary Hospital was 1,500, at a daily cost of £245 11s. 5d., whilst the credit side shows the value of

the horse cured and issued for duty; £15 is purposely taken as a very low average price for a horse; every kind of animal was represented, from the ordinary country pony of South Africa, whose war value was well over £15, to the artillery horse which cost about £80, when landed in the country. There were usually some very young or useless horses, which helped to reduce the average value. No sum is placed on the debit side for the purchase price of horses admitted, because it is considered that they were of no practical value to the Army, being unfit for work when sent into the Veterinary Hospital. If a fair price were put on these practically valueless horses when admitted, a correspondingly higher price would be expected for them when issued. In a veterinary hospital where the numbers are continually altering, it is almost impossible to give without intricate calculations the actual total expenditure. The number of horses admitted and cured, as well as the number of casualties shown on the credit side, are taken from the case book kept in the Veterinary Hospital.

It is possible to argue about the valuation of sick horses in another way, namely, an animal is essentially a "fixed asset," and so should not be valued for what he would fetch, but at the cost of replacement less depreciation. But depreciation, if the horse is really serviceable, only means the deduction made because part of his working life is spent. If, however, he has as good a chance of lasting to the end of the war as an ordinary remount, his life will be as long as we want it to be. We shall hardly be looking even economically beyond the end of the war, and so might value him at the full cost of replacement.

It is possible, too, that the strictly anti-economic view would find much favour. Our object, it might be said, is to win the war on unlimited credit in the shortest space of time, therefore the question is not what a veterinary hospital costs, but whether it turns out serviceable horses in the quickest possible time with the least possible interference with other military enterprises.

The admissions show the amount of work in a veterinary hospital during war. The number of deaths and destructions (almost a third of the total admissions) point to the fact that units keep their horses too long, and that they wait until disease assumes a severe form, from which recovery is in many cases impossible. No doubt this, in the South African War, was due to the difficulty of getting fresh horses, as commanding officers argued that "any horse is better than none." Under more stringent orders with regard to admission of sick horses, the more careful administration in veterinary hospitals, and a larger staff for supervision, the profits which represent the utility on service of the veterinary hospitals should increase greatly owing to the

more efficient handling of sick horses; but, in order to make the hospitals as profitable as possible, improvements in remount arrangements are needed.

At a later period in the war the mortality was not by any means so large owing to the erection of stables, and provision of a larger staff of officers and men detailed to look after the sick.

In order to bring the information as nearly up to date as possible, I propose to apply my data to ascertaining the expenses of a veterinary section as provided by regulations (*vide* Table III.). The rates of pay of the establishment are taken from regulations, where laid down, and the prices of the rations and the various other items of expenditure are the proportionate share of the expenses incurred in a veterinary section on the same basis as in Table I.

It has been assumed that native labour for horse-keepers is not available, and that 14s. per week with keep and tentage is a fair wage.

Under these conditions the daily cost of treatment of a horse is more, amounting to 4s. 7d. a day (*vide* Table III.), as against 3s. 3d., but then it may be expected that, with a more efficient staff, better supervision, and admission for treatment at an earlier stage of disease, the mortality will not be so high, nor the period of detention so long, so that the amount shown on the credit side will be correspondingly increased.

In order to make veterinary sections still more profitable assets to the State, they should be fully equipped with establishment at the outbreak of a campaign and act as conveyers of fit horses between the mounted troops and the Remount Department. By this means a saving would be made of all remount depôt staffs, except those for the purchase and impressment of horses, while a continuous stream of fit animals could be passed up to the front, through veterinary sections, and a stream of sick horses, requiring prolonged detention, passed down by the same means to those places where more economical treatment and feeding of the sick could be undertaken.

This scheme would entail less work for the mounted troops, as when they send back sick horses they could draw fit ones from the same place, *i.e.*, the veterinary section in touch with them. It may be argued that it would be impossible to keep the healthy and diseased horses apart, but a workable arrangement can easily be devised, and, to anyone acquainted with active service conditions, it is well known that every remount depôt has always a very large number of sick in each depôt which do not come in contact with the healthy.

It may fairly be claimed that this scheme is economical and permits the remount officers to attend to their most important

duty, *i.e.*, the selection, purchase, and collection of horses suitable as remounts, for which they are specially qualified. The horses when collected should be handed over to a veterinary section (or probably two or three combined) at the base, and so drafted up through various sections to the mounted troops, to replace casualties. Remount depôts require veterinary officers, but veterinary sections can be worked without remount officers and their staff, and, for this reason, it is suggested, veterinary sections should be selected as the means for conveying horses to the mounted troops. As war continues the issue of horses from remount depôts is, in a great proportion, simply a re-issue of those which have been treated in veterinary hospitals and become fit. It would appear, therefore, that the proposed scheme must be economical.

If this plan were adopted it would make veterinary sections a still greater asset to an army than they are now, and abolish the rather cumbersome method of rehorsing mounted troops which prevails at present.

It will be noticed that it is only suggested that this scheme be adopted in war time, and that it in no way relieves remount officers of the responsibility for the purchase of suitable and fit horses as remounts.

In this short financial statement of the working of veterinary hospitals in war time, all references have been avoided to any advantage accruing to the Army from the fact that the sooner the horses are returned to the ranks the more efficient the mounted troops will be.

I believe that it is a recognized fact that if the troops had been more efficiently mounted during the South African War it would have been of *incalculable* advantage to the Army. With the advances made in aviation it appears possible that the army which is the better mounted and able to change its dispositions and move with the greatest speed will be at a considerable advantage; therefore it is all the more necessary that efficient remount and veterinary arrangements should be made.

If the facts in this article are admitted as correct, or approximately so, the following deductions can be drawn:—

(1) That veterinary hospitals or sections, if managed on economical lines, are a real saving to the State.

(2) That in order to be worked to the best advantage horses should be sent into the veterinary sections at an earlier stage of disease than is customary; and this means that the Remount Department should arrange for a more constant and ***seasoned*** class of remount, so as to enable commanding officers to send the sick horses into hospital at an early stage.

(3) Although since the South African War the Army Veteri-

nary Service has been reorganized so as to provide sections for the equipment of veterinary hospitals, it is, in my opinion, advisable that this number should be still further increased so as to enable officers, non-commissioned officers, and men to attain such peace training as will fully qualify them for their all-important work during war.

(4) That in order to administer a veterinary section in the most economical manner, no reduction in the staff laid down in regulations either of officers, non-commissioned officers, or men should be allowed.

(5) That more attention should be given to the question of shelter for sick horses and feeding arrangements when on service.

(6) That, in war time, veterinary sections should act as conveyers to fit horses between the Remount Department and the mounted troops.

Even admitting that the figures shown on the debit side of Table II. are under-estimated, the profit shown is so enormous that it would allow of considerable addition to the expenditure in a veterinary unit without working it at a loss to the State. The table points out conclusively that veterinary units, if run on sound lines, are a considerable financial asset to the Army, and the recent re-organization of the Army Veterinary Corps appears to have been fully justified.

TABLE I.

DAILY EXPENSES INCURRED BY A FIELD VETERINARY HOSPITAL. THE ACCOUNT IS BASED ON THE ASSUMPTION THAT AN AVERAGE OF 1,500 ANIMALS ARE IN THE HOSPITAL. THE TABLE INCLUDES THE PAY OF STAFF, EXPENDITURE ON RATIONS, MEDICINE, &C., AND LOSS DUE TO DEPRECIATION.

Description of Items.	£	s.	d.
(1) Pay and allowances of Veterinary Officer (Lieut.)	1	0	8
(2) Pay of Soldiers employed	1	15	6
(3) Pay of Civilians employed	4	8	0
(4) Pay of Natives employed (horse attendants)	17	14	8
(5) Rations of above Staff	26	4	5
(6) Medicine daily cost*	1	5	0
(7) Wear and tear of equipment	4	15	2
(8) Horse rations, 1,500 animals at 2*s.* 6*d.* per day per animal ...	187	10	0
(9) Incidental expenses, such as instruments, stationery, postage, repairs to standings, enclosures, &c.	0	19	0
Total daily expenses	245	12	5
* Actual cost of medicine for six months	217	18	3¼
Cost of carriage and transport abroad calculated at 5 per cent.	10	17	6
Total	£228	15	9¼

These prices were taken from current price lists of Willows, Francis, Butler and Thompson, and Baird and Tatlock. The total sum of £228 15*s.* 9¼*d.* represents the value of all issues from the Veterinary Store Depôt to the Veterinary Hospital from April 1, 1901, to September 26, 1901.

Table II.

Balance Sheet from April 1, 1901, to October 1, 1901.

Credit.		Debit.	
Total number of animals admitted from April 1 to October 1, 1901 (all unfit for services)	7,481	Expenses of hospital from April 1 to October 1, 1901— 183 days at £245 11 5	£44,939 9 3
Total number animals cured, April 1, 1901, to October 1, 1901	4,232		
Total number animals died and destroyed	1,790		
	6,022		
Remaining in hospital	1,459		
	7,481		
Cured (from average for previous 5 months)	879		
Died (from average for previous 5 months)	580		
	1,459		
Total cured	5,111		
Total died and destroyed ...	2,370		
	7,481		
		To credit	31,725 10 9
5,111 animals at £15 ...	£76,665 0 0		£76,665 0 0

Table III.

Daily Expenses of a Veterinary Section.

Calculation based on the assumption that 250 horses are under treatment in the Section together with Staff according to Regulations, under similar conditions as shown in Table I.

Description of Items.	£	s.	d.
(1) Pay and allowances of two Veterinary Officers*	2	6	0
(2) Pay of Staff (para. 778 and 779 Royal Warrant)	3	7	8
(3) Pay of 83 horse keepers at 2*s.*	8	6	0
(4) Rations of 114 Europeans at 1*s.* 9*d.*	9	19	6
(5) Medicine daily cost	0	4	2
(6) Wear and tear of equipment	1	13	7
(7) Horse rations 250 animals at 2*s.* 6*d.* per day per animal ...	31	5	0
(8) Incidental expenses	0	3	0
	£57	4	11

* An average figure taken, since the actual rate depends on the rank of officers doing duty with the Section.

—*United Service Magazine.*

Clinical Article.

AN INTERESTING ABDOMINAL CASE.

By FREDERICK HOBDAY, F.R.C.V.S.
Kensington, W.

THE patient was a pedigree bull bitch, 4½ years old, which had been the subject of metritis for some six or eight months. She had never been allowed to have puppies, and the discharge was purulent and most excessive, especially during and immediately after œstrum. Persistent syringing with astringents and antiseptics had considerably alleviated matters, but the discharge never ceased completely; and as after a long course of tonics and good dietary she was perceptibly growing thinner, it was decided to operate and remove the uterus and ovaries.

This was done on November 10, the bitch being under the influence of morphia and the abdomen painted with tincture of iodine without any preliminary washing. The internal muscles were united with catgut and the edges of the skin with silkworm gut.

Nothing untoward was observed until about 11.30 p.m. on the evening of the 19th, when the nurse in whose care the animal was placed observed that the bitch was uncomfortable and that something protruded from the wound. This, upon closer examination, proved to be omentum, and from its congested appearance I judged that it had been extruded for at least an hour and probably more. With all possible speed and care the animal was placed upon the operating table in the dorsal position and carefully examined. It was found that one of the internal catgut ligatures had given way and that the omentum had escaped at this place. The protruding portion was carefully excised with scissors and the stump returned, the muscles being resutured with boiled silk. The skin was again sutured with silkworm gut, and the whole, after being dressed with iodine, fixed tightly with an antiseptic cotton-wool pad and a bandage.

The wound was redressed with tincture of iodine every day and rebandaged, the recovery being absolutely uninterrupted.

The patient went out of hospital on the 24th apparently none the worse for her experience.

Reviews.

The Veterinary News. A weekly journal of British and Foreign Veterinary Medicine, Surgery, and Sanitary Science. Price 10s. 6d. per annum, post free. Published by Messrs. Baillière, Tindall and Cox, Covent Garden, W.C.

The December 13 issue is intended as a specimen copy of the manner in which *The Veterinary News* will be conducted during the forthcoming year, and the standard set by the editorial

staff and publishers is a very high one. All branches of the profession will be catered for, and the practitioner, the Army, the municipal services, and our colleagues abroad, will each find something of interest to illustrate the advances veterinary science is making.

The newly arranged editorial staff is a strong combination of talent, each being a specialist in the respective branch of which he has been given control, and from the letter which has been issued to the profession it can also be seen that the publishers and their managing staff are also determined to give the paper every support.

Established a few years ago merely as a pamphlet of a few pages under the editorship of the late Colonel Nunn, *The Veterinary News* has weathered the storm which all new ventures of this kind must of necessity pass through and may now be said to be firmly established as an impartial weekly paper, whose sole aim is to advance the welfare of the profession and to keep its readers up to date in the work which is being done, not only in England but in every part of the civilized world. Some twenty pages are entirely given up to professional matters, and advertisements of instruments, books, drugs, practices for sale, and assistantships vacant make up a further eight pages, the whole being a distinct adjunct to veterinary journalism.

"Our Dogs" Christmas Number. Price 6d. Published by *Our Dogs* Printing Office, Manchester.

The Christmas Annual of *Our Dogs* is the most wonderful sixpennyworth which is ever issued to the canine world, and this year it has (if possible) beaten its predecessors. To the canine practitioner it is indispensable, and, indeed, every veterinary surgeon ought to possess a copy, not merely to read and throw away, but as a work of reference. Within its voluminous pages are hundreds of photographs of the best dogs in Great Britain (which means the best in the world) and their owners, with full description of their kennels and methods of breeding and showing.

The great success which such a paper as *Our Dogs* has attained is a still further stimulus to the members of our profession to devote more and more time to the ailments of their canine patients.

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